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FOREST SERVICE

SOUTH FORK SALMON RIVER
STABILIZATION PROGRAM

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SOUTH FORK SALMON RIVER

STABILIZATION PROGRAM

Approval Recommended By ______________________ 4/11/69
Forest Supervisor, Boise N. F. — Date

Approval Recommended By ______________________ 4/11/69
Forest Supervisor, Payette N. F. — Date

Approved By Floyd Iverson 5/5/69
Regional Forester — Date

SOUTH FORK SALMON RIVER
STABILIZATION PROGRAM

I. INTRODUCTION

  A. Statement of Problem
  B. History
  C. Study Analysis

II. OBJECTIVES OF STABILIZATION PROGRAM

III. ALTERNATIVE PROGRAMS FOR GAINING OBJECTIVES

  Alternative 1
  Alternative 2
  Alternative 3

IV. RECOMMENDED ALTERNATIVE JUSTIFICATION

  A. Justification
  B. Onsite Benefits
  C. Offsite Benefits

V. PROJECT ORGANIZATION

  A. Coordinator (Liaison Officer)
  B. Engineer
  C. Resource Manager
  D. Business Management Specialist

VI. INFORMATION AND EDUCATION

VII. REFERENCES

VIII. MAP

SOUTH FORK SALMON RIVER
STABILIZATION PROGRAM

I. INTRODUCTION

A. Statement of Problem

During the past five years, the South Fork of the Salmon River and its tributary streams have been receiving increased amounts of sediment. Much of the sediment originates above the point where the Secesh River flows into the South Fork. Sediment production is associated with storms, snowmelt, and other weather phenomena which produce saturated granitic soils. There are many sources of sediment, some of which are natural geologic processes, while others are the direct result of utilization of forest resources. These accelerated sediment loads have adversely affected an important anadromous and resident fisheries, as well as esthetics and other resource uses.

B. History

Prior to 1940, resource uses and activities adjacent to the South Fork Salmon River were very limited. The demands for timber products did not develop until the mid-forties. As these demands increased, a transportation system was constructed to provide access into timber stands that had not been harvested. The construction of access roads (main and logging) and skid trails in the granitic soils materially increased the rate of erosion and subsequent sedimentation of the stream. Overuse by domestic livestock and wildfire have also left the area more susceptible to watershed damage. During the winter of 1964-65, rain-on-snow resulted in a rapid runoff, causing large amounts of sediment to be flushed into the South Fork Salmon River system. In 1965, Regional Forester Iverson established a South Fork Salmon River Review Committee with two basic objectives:

1. To determine any adverse change in fisheries habitat conditions occurring in the South Fork Salmon River and tributary streams, and the nature, extent, and possible remedy of such changes, if they do exist.

2. To determine if land management practices, through accelerated sedimentation, have contributed to a change in fisheries habitat conditions, and possible remedial measures, if they have.

C. Study Analysis

To meet these objectives, special surveys were made of the soils, hydrology, landform, and fisheries, following analysis of the soils and hydrology, a linear program was developed which related six alternative rehabilitation programs to sediment reduction potential. From these six alternatives, this specific plan has been developed.

II. OBJECTIVES OF STABILIZATION PROGRAM

Any stabilization program designed to fully meet the rehabilitation needs of the South Fork Salmon River area would need to meet two main objectives:

A. Reduce the effect of sediment on the South Fork Salmon River and selected tributaries to acceptable limits within five years to prevent further stream degradation and restore, where possible, the anadromous and resident fisheries.

B. Reduce the annual sediment production from key source areas to rates as near natural as is reasonably feasible.

III. ALTERNATIVE PROGRAMS FOR GAINING OBJECTIVES

The South Fork Salmon River stabilization survey report of January 1968 includes six alternative rehabilitation programs related to sediment reduction potentials. Three of these programs, which meet one or both of the above-stated objectives, were selected for further consideration. The other three alternative programs were rejected because they do not provide the necessary sediment reduction and/or they result in extremely high unit and total treatment costs. At low levels of treatment, unit treatment cost (dollars per cubic yard of sediment reduction) is high, due to continuing maintenance costs. As levels of treatment increase, unit treatment cost gradually declines until a low point of about $1.79 per cubic yard is reached, involving treatment of about 180,000 cubic yards, after which the cost rises sharply to about $7.52 per cubic yard at the 206,780-cubic-yard maximum treatment level.

The three alternative programs selected are as follows:

A. Alternative 1: This program consists of all items included in Plan 4, as outlined in the previously submitted stabilization survey report, plus the following additional items:

   1. Stabilization of Trail Creek Road (Forest Highway 22) from Big Creek Summit to South Fork Salmon River.

   2. Reconstruction and relocation of South Fork Salmon River Road (Forest Development Road 674) from Forest Highway 22 to Payette National Forest boundary.

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The three alternative programs selected are as follows:

A. Alternative 1: This program consists of all items included in Plan 4, as outlined in the previously submitted stabilization survey report, plus the following additional items:

1. Stabilization of Trail Creek Road (Forest Highway 22) from Big Creek Summit to South Fork Salmon River.

2. Reconstruction and relocation of South Fork Salmon River Road (Forest Development Road 674) from Forest Highway 22 to Secesh River.

3. Obliteration of Forest Development Road 674 west of Kline Mountain and reconstruction of Forest Development Road 027 east of Kline Mountain.

Estimated costs of Alternative 1 is $4,877,317. An annual sediment reduction of about 197,880 cubic yards would result from the above-mentioned program.

B. Alternative 2: This program is the same as Alternative 1, except that the main South Fork Salmon River Road (Forest Development Road 674) is not included for stabilization, relocation, and/or reconstruction.

The estimated costs of Alternative 2 is $3,955,263. This program would result in an annual sediment reduction of approximately 193,680 cubic yards.

C. Alternative 3: This program consists of construction and maintenance of debris basins only. Estimated cost through the five-year construction period is $1,698,246. An annual sediment reduction of about 157,220 cubic yards would result.

Table 1 includes a summary of the costs, by years, and the amounts of annual sediment reduction, for each of the three alternative programs. Table 2 includes a more detailed analysis of the costs and the amounts of sediment reduction, for Alternatives 1 and 2 only.

IV. RECOMMENDED ALTERNATIVE JUSTIFICATION

A. Accelerated and accrued sediment has destroyed largely or partially three major environments of the South Fork Salmon River fishery--the production, rearing, and fishing environments. All three must be returned to near-natural conditions in order to maintain the fishery. It would be impractical to rehabilitate one environment without the others, as each can be a limiting factor. Of the three alternatives considered, Alternative 1 would adequately restore and maintain the fishery resource and allow the river to regain favorable salmonid conditions within a five-year period. The other two alternatives, though providing some fisheries benefits, would not fully attain the desired habitat required for a salmonid fishery.

3. Obliteration of Forest Development Road 674 west of Kline Mountain and reconstruction of Forest Development Road 027 east of Kline Mountain.

4. Stabilization of Forest Development Road 674 from Secesh River to Three Mile Creek.

5. Reconstruction of Lick Creek Road (Forest Highway 48) from Lick Creek Summit to South Fork Salmon River.

Estimated costs of Alternative 1 is $4,877,317. An annual sediment reduction of about 197,880 cubic yards would result from the above-mentioned program.

B. Alternative 2: This program is the same as Alternative 1, except that the main South Fork Salmon River Road (Forest Development Road 674) is not included for stabilization, relocation, and/or reconstruction.

The estimated cost of Alternative 2 is $3,955,263. This program would result in an annual sediment reduction of approximately 193,680 cubic yards.

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TABLE 1

SUMMARY OF COSTS BY YEAR FOR EACH ALTERNATIVE PROGRAM

Alternative	Management Level	Project Year					Grand Total	Annual Sediment Reduction Cu. Yds.
		1	2	3	4	5		
1	Project	$139,045	$1,270,535	$1,426,785	$751,058	$528,640		
	Staff	80,000	80,000	80,000	80,000	80,000		
	R. O. Assessment	17,500	108,042	120,542	66,480	48,690		
	Total	$236,545	$1,458,577	$1,627,327	$897,538	$657,330	$4,877,317	197,880
2	Project	$139,045	$1,202,235	$ 641,335	$751,058	$528,640		
	Staff	80,000	80,000	80,000	80,000	80,000		
	R. O. Assessment	17,500	102,580	57,700	66,480	48,690		
	Total	$236,545	$1,384,815	$ 779,035	$897,538	$657,330	$3,955,263	193,680
3	Project	$ 19,000	$ 244,250	$ 345,550	$668,700	$294,950		
	R. O. Assessment	1,520	19,540	27,644	53,496	23,596		
	Total	$ 20,520	$ 263,790	$ 373,194	$722,196	$318,546	$1,698,246	157,220

TABLE 2.

SOUTH FORK PROGRAM ANALYSIS

March 26, 1969

Treatment Number	Subdrainage Unit	Location	Annual Sediment Reduction	Initial Construction Costs	Acquisition Costs	Maintenance Costs (5 year)	Engineering Survey and Design	Engineering Construction Supervision	Local Administration and Overhead	Year #1	Year #2	Year #3	Year #4	Year #5	Total
1B	1	South Fork Salmon Timber Sale	210	$ 4,000			$ 100	$ 300	$ 600	$ 100	$ 4,900				$ 5,000
2B	1	South Fork Salmon Timber Sale	170	4,400			140	300	660	140	5,360				5,500
3B	1	Pen Basin Stock Driveway	130	6,500			150	500	975	150	7,975				8,125
4B	1	South Fork Salmon River	80	2,000			100	100	300			$ 100	$ 2,400		2,500
6A	1	Mormon Creek	40	1,500			50	100	225				50	$ 1,825	1,875
Subtotal			630	$ 18,400			$ 540	$ 1,300	$ 2,760	$ 390	$ 18,235	$ 100	$ 2,450	$ 1,825	$ 23,000
8B	2	Bluepoint Timber Sale	840	$ 25,000			$ 500	$ 2,000	$ 3,750	$ 31,250					$ 31,250
9B	2	Bluepoint Timber Sale	360	8,900			190	700	1,335	11,125					11,125
10B	2	Pen Basin Stock Driveway	140	5,000			100	400	750	100	$ 6,150				6,250
13B	2	Lodgepole-Camp Creek	350	5,500			150	400	825				$ 150	$ 6,725	$ 6,875
14B	2	Lodgepole-Camp Creek	210	5,000			100	400	750				100	6,150	6,250
15C	2	Tyndall Creek	900	7,200		$ 6,000	7,200	3,600	7,200		7,200	$ 82,800	3,000	3,000	96,000
16A	2	Tyndall Creek	820	7,400			140	600	1,110		140	9,110			9,250
17B	2	Tyndall Creek	290	3,600			160	200	540		160	4,340			4,500
DB-1	2	Stolle Meadows DB	12,000	65,000		63,000	6,500	3,250	6,500	6,500	74,750	21,000	21,000	21,000	144,250
DB-2	2	Tyndall Creek DB #1	910	10,000			1,000	500	1,000				1,000	11,500	12,500
DB-3	2	Camp Creek DB	14,400	75,000		50,400	7,500	3,750	7,500		7,500	86,250	25,200	25,200	144,150
Subtotal			31,220	$ 282,400		$119,400	$ 23,540	$ 15,800	$ 31,260	$ 48,975	$ 95,900	$ 203,500	$ 50,450	$ 73,575	$ 472,400
DB-4	3	Tyndall Creek DB #2	910	$ 10,000			$ 1,000	$ 500	$ 1,000				$ 1,000	$ 11,500	$ 12,500
20B	3	Bear Creek	90	2,500			50	200	375		$ 50	$ 3,075			3,125
21B	3	Kline Mt.-Tulie Lake	40	1,000				100	150			1,250			1,250
22B	3	Kline Mt.-Tulie Lake	50	5,100			110	400	765		110	6,265			6,375
24B	3	S. F. Road (Kline Mt. Section)	370	280,000			28,000	14,000	28,000	$ 28,000	322,000				350,000
Subtotal			1,460	$ 298,600			$ 29,160	$ 15,200	$ 30,290	$ 28,000	$ 322,160	$ 10,590	$ 1,000	$ 11,500	$ 373,250
27A	4	Curtis Creek-Railroad Pass	460	$ 24,000		$ 5,000	$ 2,400	$ 1,200	$ 2,400		$ 2,400	$ 27,600	$ 2,500	$ 2,500	$ 35,000
28B	4	Trail Creek	1,980	368,200		15,000	36,820	18,410	36,820	$ 36,820	423,430	5,000	5,000	5,000	475,250
29B	4	Curtis Creek Timber Sales	1,800	25,800			580	2,000	3,870			580	31,670		32,250
30B	4	Curtis Creek Timber Sales	180	2,200			110	110	330			110	2,640		2,750
31B	4	Railroad Pass	310	5,000			100	400	750			100	6,150		6,250
32B	4	Railroad Pass	190	4,500			150	300	675			150	5,475		5,625
33B	4	Trail Creek Timber Sale	2,070	31,600			1,160	2,000	4,740	1,160	38,340				39,500
34B	4	Trail Creek Timber Sale	900	20,000			500	1,500	3,000	500	24,500				25,000
DB-5	4	Trail Creek DB	9,600	45,000		50,400	4,500	2,250	4,500	4,500	51,750	16,800	16,800	16,800	106,650
35B	4	Trail Creek-2 Bit Creek	1,040	18,000			500	1,300	2,700		500	22,000			22,500
36B	4	Trail Creek-2 Bit Creek	2,540	22,000			600	1,600	3,300		600	26,900			27,500
37B	4	Trail Creek-2 Bit Creek	630	10,000			300	700	1,500		300	12,200			12,500
DB-6	4	Cabin Creek DB	6,000	45,000		31,500	4,500	2,250	4,500	4,500	51,750	10,500	10,500	10,500	87,750
39A	4	Cabin Creek-Nickel Creek	590	12,000			300	900	1,800				300	14,700	15,000
40A	4	Cabin Creek	100	1,000				100	150					1,250	1,250
Subtotal			28,390	$ 634,300		$101,900	$ 52,520	$ 35,020	$ 71,035	$ 47,480	$ 593,570	$ 121,940	$ 81,035	$ 50,750	$ 894,775
44A	5	Dollar Creek	470	$ 12,000			$ 200	$ 1,000	$ 1,800		$ 200	$ 14,800			$ 15,000
45B	5	Dollar Creek	2,380	31,200			1,120	2,000	4,680		1,120	37,880			39,000
46B	5	Dollar Creek	830	22,500			750	1,500	3,375		750	27,375			28,125
DB-7	5	Dollar Creek	7,800	45,000		$ 40,950	4,500	2,250	4,500	$ 4,500	51,750	13,650	$ 13,650	$ 13,650	97,200
47B	5	Roaring Creek	80	1,000				100	150					1,250	1,250
Subtotal			11,560	$ 111,700		$ 40,950	$ 6,570	$ 6,850	$ 14,505	$ 4,500	$ 53,820	$ 93,705	$ 13,650	$ 14,900	$ 180,575
Boise Only			73,260	$1,345,400		$262,250	$112,330	$ 74,170	$149,850	$129,345	$1,083,685	$ 429,835	$148,585	$152,550	$1,944,000
49B	7	Poverty Burn	980	$ 4,000				$ 400	$ 600	$ 5,000					$ 5,000
50B	10	Martin Creek Timber Sale	170	$ 9,230			$ 223	$ 700	$ 1,385				$ 223	$ 11,315	$ 11,538
DB-8	11	Oxbow Debris Basin	103,000	$ 500,000	$150,000	$180,250	$ 50,000	$ 25,000	$ 50,000		$ 50,000	$ 150,000	$575,000	$180,250	$ 955,250
*53B	12	Buckhorn	620	$ 40,000		$ 1,500	$ 1,000	$ 3,000	$ 6,000	$ 1,000	$ 49,000	$ 500	$ 500	$ 500	$ 51,500
DB-9	12	Buckhorn Debris Basin	8,400	50,000		29,400	5,000	2,500	5,000		5,000	57,500	14,700	14,700	91,900
56B	12	Buckhorn	470	9,000			200	700	1,350	200	11,050				11,250
Subtotal			9,490	$ 99,000	$150,000	$ 30,900	$ 6,200	$ 6,200	$ 12,350	$ 1,200	$ 65,050	$ 58,000	$ 15,200	$ 15,200	$ 154,650
59B	14	Fitsum Tie Creek	1,380	$ 68,800			$ 6,880	$ 3,440	$ 6,880				$ 6,880	$ 79,120	$ 86,000
64B	15	Zena Creek West Fork	1,000	$ 14,600			$ 460	$ 1,000	$ 2,190				$ 460	$ 17,790	$ 18,250
65A	15	East Fork Zena Creek	1,130	38,500			850	3,000	5,775				850	47,275	48,125
66B	15	East Fork Zena Creek	330	11,800			180	1,000	1,770				180	14,570	14,750
67B	15	West Fork Zena Creek	940	5,800			180	400	870				180	7,070	7,250
68A	15	Brown's Pond	2,000							$ 3,500	$ 3,500	$ 3,500	3,500	3,500	17,500
Subtotal			5,400	$ 70,700			$ 1,670	$ 5,400	$ 10,605	$ 3,500	$ 3,500	$ 3,500	$ 5,170	$ 90,205	$ 105,875
Total - Alternative #2			193,680	$2,097,130		$473,400	$117,303	$115,310	$231,670	$139,045	$1,202,235	$ 641,335	$751,058	$528,640	$3,262,313
43C		South Fork Salmon Road	4,200	$ 683,000			$ 68,300	$ 34,150	$ 68,300		$ 68,300	$ 785,450			$ 853,750
Total - Alternative #1			197,880	$2,780,130	$150,000	$473,400	$245,603	$149,460	$299,970	$139,045	$1,270,535	$1,426,785	$751,058	$528,640	$4,116,063

Schultz, Skabelund, W. Williams, Benson

Alternative 3 would reduce sediment in the river system about 50 percent at the end of five years. However, this alternative would treat only some of the symptoms and would not provide a cure. Since this alternative does not provide for any treatment of the damaged watersheds which serve as the sediment source, sediment would still continue to accrue. After 12 years, when the debris basins would be filled with sediment, it would be necessary to remove 40,000 cubic yards of sediment annually to maintain minimally acceptable aquatic habitat. Annual maintenance costs beyond the 12-year period are estimated to be $285,600 for an indefinite period of many years--and then to decrease gradually as the watersheds "heal" naturally (although for long periods in some areas, this is unlikely).

Alternative 2 would be much better than Alternative 3, because correction of watershed conditions, as well as construction of debris basins, would be provided. However, although sediment reduction under Alternative 2 is considerable, the substantial continuing amounts of sediment being deposited from the existing main South Fork Salmon River Road into the stream channel would preclude attainment of a desired fish habitat. This sedimentation would also necessitate perpetual maintenance of downstream debris basins, since there would be a continuing source of sediment. Increasing public use of the South Fork area likely will require periodic improvement of the existing road. Such betterment projects would intermittently obliterate or damage many installed stabilization measures and might create additional costly stabilization situations.

Alternative 1 would adequately correct both watershed and channel conditions, to restore and maintain a satisfactory aquatic resource and allow the river to renew conditions suitable for a salmonid fishery within a five-year period. This alternative would also provide for needed public access, satisfactory from a watershed and fisheries standpoint, along the main South Fork Salmon River, through relocation and reconstruction of the existing road to a needed higher standard. Alternative 1 is recommended by the Forest Supervisors of the Boise and Payette National Forests, and by the concerned Divisions in the Regional Office.

Past estimates of economic values of the total fishery resource, using the late 1950's as a base, ranged from $432,150 to $2,577,500 annually. The current "true value" probably is about $500,000. Under present conditions, with both a degraded upriver and downriver environment, the total annual fishery resource is estimated to be worth between $79,300 and $420,150 with the "true value" somewhere near $80,000.

The future estimated economic evaluations of the total annual (tangible) fishery range between $3,365,100 and $5,577,500. Within this range, value is dependent upon many factors, such as the return of favorable conditions in upriver (spawning) and downriver (rearing and fishing) environments and the use of artificial population methods.

Using the lower total fishery value estimates above, the losses due to degraded conditions are over $350,000 annually. If optimum conditions can be restored and the necessary artificial means placed into operation, the total fishery value would annually return over $3,280,000.

Tables 3, 4, and 5 graphically portray the fishery resources during the late 1950's, 1960's, and estimated 1980's, respectively, for the South Fork Salmon River, using different methods of evaluation.

There are numerous tangible and intangible benefits derived from the direct project activities. Some of these are:

B. Onsite Benefits

1. Anadromous spawning beds
2. Anadromous rearing areas
3. Resident fishery
4. Enhancement of esthetics contiguous to river
5. Improved transportation
6. Reduced annual road maintenance
7. Improved recreation opportunities between Knox Junction and Boise-Payette Forest boundary
8. Recreation opportunities at Warm Lake
9. Access to Tule Lake
10. Provide land stability and maintain site productivity
11. Water quality
12. Provide put-take fishery at Tule Lake
13. Increased man-days fishery
14. Increased take in cold fish
15. Potential increase in production of fish through artificial run
16. Possible increase in hunter success on Kline Mountain by closure of roads
17. Provide quality hunting experience rather than jeep runs

C. Offsite Benefits

1. Resident fishery
2. Anadromous rearing area
3. Reduced sedimentation problems in river at Lewiston

TABLE 3

Preliminary Appraisal of Fishery Resources in the South Fork Salmon River Drainage During the Late 1950's

Species	Annual Value			
	Adams-Frazer Method	Return Spawners Method	New Mexico Method	Other Methods
Salmon	$1,625,000 (10,000)	$306,500		
Steelhead	802,500 (5,000)	103,000		
Resident	—	—	$150,000	$22,650
Total	$2,427,500	$409,500	$150,000	$22,650
Combined	$2,577,500 1/	$432,150 2/		

1/ Combined values based on "Adams-Frazer" and "New Mexico" methods.

2/ Combined values based on "Returned Spawners" and "Other" methods.

TABLE 4

Preliminary Appraisal of the Fishery Resources in the South Fork Salmon River Drainage During the Late 1960's

Species	Annual Value			
	Adams-Frazer Method	Return Spawners Method	New Mexico Method	Other Methods
Salmon	$162,500 (1,000)	$30,650		
Steelhead	201,000 (1,200)	26,000		
Resident	———	———	$150,000	$22,650
Total	$363,500	$56,650	$150,000	$22,650
Combined	$420,150 1/	$79,300 2/		

1/ Combined values based on "Adams-Frazer" and "New Mexico" methods.

2/ Combined values based on "Returned Spawners" and "Other" methods.

TABLE 5

Preliminary Appraisal of the Fishery Resources in the South Fork Salmon River Drainage During the Late 1980's (Assuming Rehabilitation is Accomplished)

Species	Annual Value			
	Adams-Frazer Method	Return Spawners Method	New Mexico Method	Other Methods
Salmon				
Natural	$1,625,000 (10,000)	$ 306,500		
Artificial	2,250,000 (20,000)	600,000		
Steelhead Natural	802,500 (5,000)	103,000		
Resident				
Natural			$300,000	$ 90,600
Artificial			600,000	2,265,000
Total	$4,677,500	$1,009,500	$900,000	$2,355,600
Combined	$5,577,500 1/	$3,365,100 2/		

1/ Combined values based on "Adams-Frazer" and "New Mexico" methods.

2/ Combined values based on "Returned Spawners" and "Other" methods.

4. Water quality as it affects downstream needs
5. Esthetics
6. Downstream area flood control
7. Improved commercial fishery
8. Effect on wild, scenic, or recreation classification of main Salmon River
9. Improved navigation conditions

V. PROJECT ORGANIZATION

Because of the need for continuing detailed planning coordination between National Forests and among the several disciplines, it is recommended that a project task group be created to manage the overall project. The task group should consist of a project leader, an engineer, a resource manager, and a business management specialist. The group should be assigned to one of the National Forests for administrative purposes but prepare detailed plans and supervise work on both Forests. The group will need assistance from specialists located on both Forests and at the Regional Office. Other needed personnel will be recruited and administered by the concerned Forests.

VI. INFORMATION AND EDUCATION

Present conditions of these watersheds and streams have been cause for widening criticism and attack on National Forest administration of public lands. This criticism has come from individuals, organizations, various levels of Government, and user groups.

Public education regarding this work must be directed to:

A. Interpreting the findings of the various surveys and studies of the area.

B. Showing why it is desirable and necessary to conduct a multi-million dollar rehabilitation project on this particular drainage.

C. Currently airing plans of work--again emphasizing why, and pointing out anticipated results.

D. Showing and publicizing accomplishments.

E. Covering a broad segment of the population to assure widespread understanding of the start, progression, and solution of the problem.

F. Discussing future plans for management and permissible use of this and similar land areas.

VII. REFERENCES

South Fork Salmon River Special Survey Soils and Hydrology Report, January 1968.

South Fork Salmon River Special Survey Stabilization Survey Report, June 1968.

South Fork Salmon River Aquatic Habitat Survey Report, March 1968.